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Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Eduard HOFFMANN et al.

Serial No.: 08/856,944

Filed: May 15, 1997

For: A Carrying Sleeve For Printing And Transfer Forms And A Process For Production Of Such A Carrying Sleeve

Examiner: Eickholt, Eugene H.
Group Art: 2854

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Name of applicant, assignee or Registered Representative

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September 25, 2003
Date of Signature

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LETTER SUBMITTING TRANSLATION PRIORITY DOCUMENT

In response to the Examiner request in the Office Action dated June 25, 2003, enclosed herewith is a certified translation of Application No. P 44 32 814.1 filed on September 15, 1994 in Germany, upon which the priority claim of the present application is based.

Respectfully submitted,
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By

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The Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

I, the below-named translator, hereby declare that:

My name and post office address are as stated below;

That I am knowledgeable in the English language and in the language in which the below-identified international application was filed, and that I believe the English translation of (German) Application No. P 4432 814.1 is a true and complete translation of the above-identified (German) application as filed.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date 8/25/1995

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Description:

Carrying Sleeves for Printing and Transfer Forms

The invention relates to a carrying sleeve for printing and transfer forms of a metal material, the initial form of which is a rectangular, thin-walled flat sheet, which is shaped by bending into the desired hollow cylindrical form and wherein the edges of the flat sheet pointing toward one another are connected permanently to one another.

It is sufficiently known today from flexographic printing to place sleeve-type printing and transfer forms on galvanically-produced nickel sleeves. Printing and transfer forms produced in this manner can be slipped by means of pressurized air over a printing cylinder core in the known manner and affixed thereto by shutting off the air supply. Carrying sleeves of fiberglass-reinforced plastic and even of carbon-fiber-reinforced plastic are also used for this purpose. However, it is relatively expensive to use the materials nickel and fiberglass-reinforced plastic or even carbon-fiber-reinforced plastic for carrying sleeves.

German Patent Application P 41 40 768 discloses a sleeve-type offset printing form produced from a rectangularly-cut metal plate, wherein the edges of the plate pointing toward one another are connected by means of a welded seam. The carrying sleeve produced in this manner is coated and exposed all around except for the welded seam.

DE 42 17 793 C1 discloses a sleeve-type offset rubber blanket that is also produced from a cut base plate, to which, while it is flat, a rubber coat is applied, and wherein the beginning and the end of the base plate, along with the rubber coat, are welded together.

Using these sleeve-type printing and transfer forms, it is possible to print in a channel-free fashion, but not continuously, i.e., only finite printing products can be produced. Until now, the use of a continuous offset printing form has not become known.

Starting from this, the object of the present invention is to provide relatively economical carrying sleeves for printing forms as well as for transfer forms, with which continuous printing is possible.

This object is attained by means of a carrying sleeve as in Claim 1 and the characterizing process steps of Claim 8.

A carrying sleeve for printing and transfer forms of a metal material, the initial form of which is a rectangular, thin-walled flat sheet, which is bent into the desired hollow cylindrical form and the edges of which pointing toward one another are permanently connected to one another, wherein the sleeve surface is processed in order to form a homogeneous outer surface so that continuous printing can be carried out, represents an advantageous alternative to nickel, fiberglass-reinforced plastic and carbon-fiber-reinforced plastic sleeves from both ecological and economic points of view which, in addition, can be used universally for various printing methods.

The production costs for a welded precision sleeve processed according to the invention are many times lower than the production costs for galvanized nickel sleeves or coiled carrying sleeves of fiberglass-reinforced plastic or carbon-fiber-reinforced plastic, especially since it is becoming increasingly difficult to produce nickel sleeves galvanically, because this production method is accompanied by heavy environmental pollution.

Furthermore, in a particularly advantageous manner, it is possible to produce the carrying sleeves according to the invention from aluminum, steel, high-quality steel, copper or brass, depending on the particular intended use.

Figure 1 shows, in highly schematic fashion, an example of a carrying sleeve 1 of a metal material, which may be aluminum, steel, high-quality steel or brass. The initial form is a rectangular, thin-walled flat sheet, which is bent into the desired hollow cylindrical form. Preferably, the edges of the flat sheet pointing toward one another are permanently connected to one another by means of a welded seam 2.

Figure 2 shows how it is possible to produce the carrying sleeve 1 in a quasi-continuous fashion, as is currently done in tube welding. The welding process itself is carried out by means of a laser beam. The precision sheets of aluminum, steel, high-quality steel, copper or brass preferably have a wall thickness *s* of 0.1 to 0.6 mm. The carrying sleeves may also be produced by means of the welding device known from DE 43 11 078.

The external surface of the [welded] carrying sleeve 1 is processed so as to create a homogeneous, continuous outer surface. To carry out this surface processing, it is possible to use known production methods for smoothing a metal surface, such as turning, polishing or the like. In selecting the initial wall thickness of the thin-walled flat sheet, it is necessary to take into account the material that will be removed from the external surface of the welded carrying sleeve.

As shown in Figure 3, an especially advantageous embodiment of the welded seam provides a seam reinforcement 3 on the external surface of the sleeve 1 and then processes this seam reinforcement, in a subsequent process step, in such a way that a continuous, endless outer surface is created on the carrying sleeve surface, without any removal of material from the precision metal sheet being necessary or, at least, with only lesser material removal being necessary.

The seam reinforcement 3 is attained through welding filler materials, for example, wire or powder, or through deliberate protective gas feeds, or

through deposit welding following the actual welding process.

For use in offset printing as the carrying sleeve 1 for a printing form, the entire sleeve surface, including the connecting seam, in the present case a welded seam 2, is subsequently chemically roughened, anodized and provided with a final photosensitive coat, as is already known from the process steps during printing plate production. In respect to technical printing characteristics, this printing form sleeve is identical to usual printing plates, except that this printing form sleeve permits continuous printing. Preferably, aluminum sheets are used here.

However, it is also possible to apply a water-conducting coat to an aluminum sleeve or another metal sleeve, when the sleeve material itself is not water-conducting but is to be made water-conducting. Ceramic materials, for example, may be applied as water-conducting coats by means of thermal spray processes.

For letterpress printing, especially for flexographic printing, the welded precision sleeve 1, the surface of which is processed as described above, may also be used directly as the carrier of a flexible printing form, rubber stereo or engraved rubber printing form and thus replace the known nickel, fiberglass-reinforced plastic and carbon-fiber-reinforced plastic sleeves.

For use in gravure printing, a metal coat, preferably a copper alloy, is galvanized or sprayed all around on a welded carrying sleeve, the surface of which has been processed as described above, and the metal coat itself is then engraved in a subsequent work step. However, plastic coats may also be applied, which also are engraved upon.

For use in offset printing as a carrying sleeve 1 for a transfer form, the entire processed surface of the sleeve, including the connecting seam 2, is covered by a continuous rubber coat, so that these rubber blanket sleeves are identical to usual rubber blankets in respect to technical printing characteristics; however, these rubber blanket sleeves make it possible to carry out continuous printing.

The type of rubber coat depends on the particular printing method and is not dependent on the material of the carrying sleeves.

Abstract:

In a carrying sleeve 1 for printing and transfer forms of a metal material, the initial form of which is a rectangular thin-walled flat sheet, which is bent into the desired hollow cylindrical form and wherein the edges of the flat sheet which point toward one another are permanently connected to one another, the sleeve surface is processed in order to form a homogeneous continuous outer surface, so that continuous printing can be carried out.

(Fig. 1)

Patent Claims:

1. Carrying sleeve (1) for printing and transfer forms of a metal material, the initial form of which is a rectangular, thin-walled flat sheet, which is brought by means of bending into the desired hollow cylindrical form and the edges of the flat sheet facing one another are connected permanently to one another, characterized by the fact that the sleeve surface is processed in order to form a homogeneous, continuous circumferential surface, so that continuous printing is possible.

2. Carrying sleeve as in Claim 1, characterized by the fact that the thin-walled flat sheet is of aluminum.

3. Carrying sleeve as in Claim 1, characterized by the fact that for use in offset printing the entire sleeve surface, including the connecting seam (2), is chemically roughened, anodized and provided with a final photosensitive coat.

4. Carrying sleeve as in Claim 1, characterized by the fact that for use in offset printing, the entire sleeve surface, including the connecting seam (2), is provided with a water-conducting coat.

5. Carrying sleeve as in Claim 1, characterized by the fact that for use in gravure printing, the entire sleeve surface, including the connecting seam (2), is provided with an engraved copper coat.

6. Carrying sleeve as in Claim 1, characterized by the fact that for use for a transfer form, the entire sleeve surface, including the connecting seam (2), is covered with an endless rubber coat.

7. Carrying sleeve as in Claim 1, characterized by the fact that it may be used directly as the carrying sleeve (1) of a flexible printing form for flexographic printing.

8. Process for producing a carrying sleeve (1) for printing and transfer forms, in which a base plate corresponding in size to the circumference and breadth of the printing cylinder used is cut from thin-walled sheet metal drawn from a roll and in the flat state, the base plate is brought by means of bending into the desired cylindrical form, and the edges of the base plate pointing toward one another are connected permanently to one another, characterized by the fact that the connection of the edges of the base plate pointing toward one another is produced by means of a welded seam (2), which is designed in such a manner that a seam reinforcement (3) is created on the external surface and during the processing of the entire sleeve surface in order to form a homogeneous, continuous outer surface the seam reinforcement (3) is fit into this homogeneous outer surface.

9. Process as in Claim 8, characterized by the fact that the seam reinforcement (3) is attained by means of welding filler materials.

10. Process as in Claim 8, characterized by the fact that the seam reinforcement (3) is achieved by means of deliberate protective gas feeds.

11. Process as in Claim 8, characterized by the fact that the seam reinforcement (3) is attained by means of deposit welding following the actual welding process.

12. Process for producing an offset printing form using a carrying sleeve as in Claim 8, characterized by the fact that the entire sleeve surface

is processed in order to obtain a homogenous, continuous outer surface, the hollow cylindrical form (1) of the base plate is chemically roughened and anodized and subsequently provided with a photosensitive coating all around on its external surface and is thus made into a printing form sleeve for continuous printing.

13. Process as in Claim 12, characterized by the fact that aluminum is used as the material for the base plate.

14. Process for producing a gravure printing form using a carrying sleeve as in Claim 8, characterized by the fact that a metal coat is applied to the processed external surface of the hollow cylindrical form (1) and is then mechanically processed.

15. Process as in Claim 14, characterized by the fact that a copper alloy is used for the metal coat.

16. Process for producing a transfer form using a carrying sleeve for printing and transfer forms as in Claim 8, characterized by the fact that an endless rubber coating is applied to the entire processed sleeve surface.

17. Process for producing a printing form using a carrying sleeve as in Claim 8, characterized by the fact that an endless ceramic coat is applied to the entire processed sleeve surface.